TRANSCRIPT OF DECISION OF FINAL REJECTION

(TRANSLATION)

Mailing date: March 4, 2003

Patent Application Number: 10-535961

Patent Office Examiner Masahiro Inoue

Date of Decision: February 25, 2003

Title of the Invention: Dispersible, Metal Oxide-Coated, Barium Titanate Materials

Applicant: Cabot Corporation

Attorney: Takashi Ishida et al

It is deemed that this application should be rejected based on the reasons set forth in the notice of reasons for rejection dated June 24, 2002.

The contents of the written argument and amendment were examined, but no grounds sufficient to overturn the reasons for rejection could be found.

Note:

Reason A:

In the argument, the applicant explained that cited reference 1 fails to teach that at least 90% of coated barium titanate-based particles have a particle size of less than 0.9 μm. However, as indicated in the Notice of Reasons for Rejection, reference 1 discloses powders having particle sizes of 0.2 - 0.6 μm (i.e. less than 0.9 μm) and a uniform and sharp size distribution. Therefore, most (at least 90%) of the particles are very probably less than 0.9 μm. In addition, no evidence to reverse this assumption was presented. Therefore, it is deemed that the argument put forward by the applicant is not persuasive.

This transcript is certified to be true to the original.

Date March 4, 2003

Seal of MITI Officer

MITI Administrative Officer

Reason B:

In the argument, the applicant explained that cited references 2 - 4 fail to teach that at least 90% of coated barium titanate-based particles have a particle size of less than 0.9 μm, and that, granting that a combination of references 2 - 4 with cited reference 1 or 5, such resulting particles of "at least 90%" and "less than 0.9 μm" could not be expected by a person skilled in the art. However, as stated in Reason A, reference 1 is considered to disclose "at least 90%" and "less than 0.9 μm". Therefore, it is deemed that the argument presented by the applicant is not persuasive.

Attorney's Reference No.: Mailing No.: 209427
Mailing Date: July 2, 2002 1/3

NOTICE OF REASONS FOR REJECTION

(Translation)

Patent Application No.: 10-535961

Drafting Date: June 24, 2002

Patent Office Examiner: Masahiro Inoue

Attorney for Patent Applicant: Takashi Ishida et al.

Applicable Provisions: Article 29, paragraph 1;
Article 29, paragraph 2

It is deemed that this application should be rejected for the following reasons. Any argument should be submitted in writing within **three months** from the mailing date of this notice.

REASONS

A. The inventions described in the following claims, of this application are inventions described in the following publication distributed in Japan or a foreign country prior to the filing of the patent application, and therefore are unpatentable under Article 29, paragraph 1, item 3, of the Patent Law.

Remarks

(For the numbers of the cited references, etc., see the List of Cited References)

- Re claims 1, 7 - 11, 16 - 20, 40, 46 - 50 and 55 - 59
- Cited reference 1

Cited reference 1 discloses powders having particle sizes of 0.2 - 0.6 μm and a uniform and sharp size

distribution which are obtained by sintering a precipitate containing $BatiO_3$ and a metal oxide (e.g. cobalt or niobium oxide) (see claim 1). Reference 1 also discloses a dispersion containing the powders and polymers as well as a precipitate thereof. Therefore, at least 90% of the particles are considered to be less than 0.9 μm. Further, a metal hydroxide or a metal oxide is considered to be coated on the surface of the particles.

B. The inventions described in the following claims of this application are deemed ones which could easily have been made, prior to the filing of the present application, by a person with ordinary skill in the art to which the inventions pertain, on the basis of the inventions described in the following publications distributed in Japan or a foreign country prior to the filing of the present application, and therefore are unpatentable under the provisions of Article 29, paragraph 2, of the Patent Law.

Remarks

(For the numbers of the cited references, etc., see the List of Cited References)

- Re claims 1 - 59
- Cited reference 1

Cited references 2 - 4 disclose $BatiO_3$ wherein a primary particle size is less than 0.2 μm and at least 90% of particles have a particle size of less than 0.9 μm. In addition, references 1 and 5 disclose $BatiO_3$ powders coated with metal oxides.

Therefore, it is deemed that a person skilled in the art could have easily selected $BatiO_3$ powders disclosed in references 2 - 4 as a desirable raw material for preparing ceramics with uniform, fine particles and also could have

easily coated the $BatiO_3$ powders with metal oxides as a dopant as described in references 1 and 5.

No. List of Cited References

1. Japanese Unexamined Patent Publication (Kokai) No. 1-69514

2. Japanese Unexamined Patent Publication (Kokai) No. 5-330824

3. Japanese Unexamined Patent Publication (Kokai) No. 6-64924

4. Japanese Unexamined Patent Publication (Kokai) No. 6-345518

5. Japanese Unexamined Patent Publication (Kokai) No. 62-297214

Record of Results of Prior Art Search

Technical Fields Searched IPC 7th edition

Prior Art

Japanese Unexamined Patent Publication (Kokai) No. 5-58605

Japanese National Patent Publication OF PCT Application No. 5-504122

This record of the results of the prior art search does not constitute a reason for rejection.

Copy of Pending Claims of Japanese Patent Application Number 10-535961 At the Time of the Office Action Dated February 25, 2003

1. Barium titanate-based particles having a coating comprising a metal oxide, metal hydrous oxide, metal hydroxide or organic acid salt of a metal other than barium or titanium, wherein at least 90 percent of said coated particles have a particle size less than 0.9 micrometer.

2. The barium titanate-based particles according to claim 1 having a primary particle size less than 0.6 micrometer.

3. The barium titanate-based particles according to claim 1 having a primary particle size less than 0.5 micrometer.

4. The barium titanate-based particles according to claim 1 having a primary particle size less than 0.4 micrometer.

5. The barium titanate-based particles according to claim 1 having a primary particle size less than 0.3 micrometer.

6. The barium titanate-based particles according to claim 1 having a primary particle size less than 0.2 micrometer.

7. The barium titanate-based particles according to claim 1 wherein said coated particles have a particle size distribution decile ratio of D_{90}/D_{10} less than 4.

8. The barium titanate-based particles according to claim 1 wherein said coated particles have a particle size distribution decile ratio of D_{90}/D_{10} less than 3.

9. The barium titanate-based particles according to claim 1 wherein said coated particles have a particle size distribution decile ratio of D_{90}/D_{10} less than 2.5.

10. The barium titanate-based particles according to claim 1 wherein at least 90 percent of said coated particles have a particle size less than 0.8 micrometer when said particles are dispersed by high shear mixing.

11. The barium titanate-based particles according to claim 1 wherein at least 90 percent of said coated particles have a particle size less than 0.7 micrometer when said particles are dispersed by high shear mixing.

12. The barium titanate-based particles according to claim 1 wherein at least 90 percent of said coated particles have a particle size less than 0.6 micrometer when said particles are dispersed by high shear mixing.

13. The barium titanate-based particles according to claim 1 wherein at least 90 percent of said coated particles have a particle size less than 0.5 micrometer when said particles are dispersed by high shear mixing.

14. The barium titanate-based particles according to claim 1 wherein at least 90 percent of said coated particles have a particle size less than 0.4 micrometer when said particles are dispersed by high shear mixing.

15. The barium titanate-based particles according to claim 1 wherein at least 90 percent of said coated particles have a particle size less than 0.3 micrometer when said particles are dispersed by high shear mixing.

16. The barium titanate-based particles according to claim 1 wherein substantially all of said particles are equiaxed or spherical.

17. A slurry, dispersion or slip comprising at least 50 weight percent of said coated particles according to claim 1.

18. The slip according to claim 17 further comprising between 3 and 20 weight percent of a binder composition comprising a dissolved or suspended, film-forming, polymer.

19. A wet cake comprising coated particles according to claim 1 and between 15 and 35 weight percent of an aqueous liquid.

20. The wet cake of claim 19 further comprising a moisture barrier that provides shelf life such that after 30 days said wet cake is dispersible by the admixture of a dispersing agent by high shear mixing into an aqueous dispersion of the coated particles, 90 percent of which have a particle size less than 1 micrometer.

21. Barium titanate-based particles having a primary particle size less than 0.6 micrometer and a coating comprising an oxide, hydrous oxide, hydroxide of at least one metal selected from the group consisting of lithium, magnesium, calcium, strontium, scandium, zirconium, hafnium, vanadium, niobium, tantalum, manganese, cobalt, nickel, zinc, boron, silicon, antimony, tin, yttrium, lanthanum, lead, bismuth or a Lanthanide element, wherein at least 90 percent of the coated particles have a particle size less than 0.9 micrometer.

22. The barium titanate-based particles according to claim 21 having a primary particle size less than 0.5 micrometer.

23. The barium titanate-based particles according to claim 21 having a primary particle size less than 0.4 micrometer.

24. The barium titanate-based particles according to claim 21 having a primary particle size less than 0.3 micrometer.

25. The barium titanate-based particles according to claim 21 having a primary particle size less than 0.2 micrometer.

26. The barium titanate-based particles according to claim 21 wherein said coated particles have a particle size distribution decile ratio of D_{90}/D_{10} less than 4.

27. The barium titanate-based particles according to claim 21 wherein said coated particles have a particle size distribution decile ratio of D_{90}/D_{10} less than 3.

28. The barium titanate-based particles according to claim 21 wherein said coated particles have a particle size distribution decile ratio of D_{90}/D_{10} less than 2.5.

29. The barium titanate-based particles according to claim 21 wherein at least 90 percent of said coated particles have a particle size less than 0.8 micrometer when said particles are dispersed by high shear mixing.

30. The barium titanate-based particles according to claim 21 wherein at least 90 percent of said coated particles have a particle size less than 0.7 micrometer when said particles are dispersed by high shear mixing.

31. The barium titanate-based particles according to claim 21 wherein at least 90 percent of said coated particles have a particle size less than 0.6 micrometer when said particles are dispersed by high shear mixing.

32. The barium titanate-based particles according to claim 21 wherein at least 90 percent of said coated particles have a particle size less than 0.5 micrometer when said particles are dispersed by high shear mixing.

33. The barium titanate-based particles according to claim 21 wherein at least 90 percent of said coated particles have a particle size less than 0.4 micrometer when said particles are dispersed by high shear mixing.

34. The barium titanate-based particles according to claim 21 wherein at least 90 percent of said coated particles have a particle size less than 0.3 micrometer when said particles are dispersed by high shear mixing.

35. The barium titanate-based particles according to claim 21 wherein substantially all of said particles are equiaxed or spherical.

36. A slurry, dispersion or slip comprising at least 50 weight percent of said coated particles according to claim 21.

37. The slip according to claim 36 further comprising between 3 and 20 weight percent of a binder composition comprising a dissolved or suspended, film-forming, polymer.

38. A wet cake comprising coated particles according to claim 21 and between 15 and 35 weight percent of an aqueous liquid.

39. The wet cake of claim 38 further comprising a moisture barrier that provides shelf life such that after 30 days said wet cake is dispersible by the admixture of a dispersing agent by high shear mixing into an aqueous dispersion of the coated particles, 90 percent of which have a particle size less than 1 micrometer.

40. Non-milled barium titanate-based particles having a coating comprising a metal oxide, metal hydrous oxide, metal hydroxide or organic acid salt of a metal other than barium or titanium, wherein at least 90 percent of said coated non-milled particles have a particle size less than 0.9 micrometer when said coated non-milled barium titanate-based particles are dispersed by high shear mixing.

41. The non-milled barium titanate-based particles according to claim 40 having a primary particle size less than 0.6 micrometer.

42. The non-milled barium titanate-based particles according to claim 40 having a primary particle size less than 0.5 micrometer.

43. The non-milled barium titanate-based particles according to claim 40 having a primary particle size less than 0.4 micrometer.

44. The non-milled barium titanate-based particles according to claim 40 having a primary particle size less than 0.3 micrometer.

45. The non-milled barium titanate-based particles according to claim 40 having a primary particle size less than 0.2 micrometer.

46. The non-milled barium titanate-based particles according to claim 40 wherein said coated non-milled particles have a particle size distribution decile ratio of D_{90}/D_{10} less than 4.

47. The non-milled barium titanate-based particles according to claim 40 wherein said coated non-milled particles have a particle size distribution decile ratio of D_{90}/D_{10} less than 3.

48. The non-milled barium titanate-based particles according to claim 40 wherein said coated non-milled particles have a particle size distribution decile ratio of D_{90}/D_{10} less than 2.5.

49. The non-milled barium titanate-based particles according to claim 40 wherein at least 90 percent of said coated non-milled particles have a particle size less than 0.8 micrometer when said particles are dispersed by high shear mixing.

50. The non-milled barium titanate-based particles according to claim 40 wherein at least 90 percent of said coated non-milled particles have a particle size less than 0.7 micrometer when said particles are dispersed by high shear mixing.

51. The non-milled barium titanate-based particles according to claim 40 wherein at least 90 percent of said coated non-milled particles have a particle size less than 0.6 micrometer when said particles are dispersed by high shear mixing.

52. The non-milled barium titanate-based particles according to claim 40 wherein at least 90 percent of said coated non-milled particles have a particle size less than 0.5 micrometer when said particles are dispersed by high shear mixing.

53. The non-milled barium titanate-based particles according to claim 40 wherein at least 90 percent of said coated non-milled particles have a particle size less than 0.4 micrometer when said particles are dispersed by high shear mixing.

54. The non-milled barium titanate-based particles according to claim 40 wherein at least 90 percent of said coated non-milled particles have a particle size less than 0.3 micrometer when said particles are dispersed by high shear mixing.

55. The non-milled barium titanate-based particles according to claim 40 wherein substantially all of said non-milled particles are equiaxed or spherical.

56. A slurry, dispersion or slip comprising at least 50 weight percent of said coated non-milled particles according to claim 40.

57. The slip according to claim 56 further comprising between 3 and 20 weight percent of a binder composition comprising a dissolved or suspended, film-forming, polymer.

58. A wet cake comprising coated non-milled barium titanate-based particles according to claim 40 and between 15 and 35 weight percent of an aqueous liquid.

59. The wet cake of claim 58 further comprising a moisture barrier that provides shelf life such that after 30 days said wet cake is dispersible by the admixture of a dispersing agent by high shear mixing into an aqueous dispersion of the coated non-milled particles, 90 percent of which have a particle size less than 1 micrometer.